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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,718	10/28/2005	Jong-Hyun Seo	6192.0654.US	9475
23413 7590 03/17/2008 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER				
SARKAR, ASOK K				
ART UNIT		PAPER NUMBER		
2891				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/554,718

**Applicant(s)**

SEO ET AL.

**Examiner**

Asok K. Sarkar

**Art Unit**

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-30 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-15 is/are rejected.
- 7) ☒ Claim(s) 7 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date 10/05 and 2/08.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 recites the limitation "contact layer" in line 2. There is insufficient antecedent basis for this limitation in the claim. The independent claim 4 recites two contact layers, ohmic and first. The claim limitation does not recite which one of the two it refers to. Lack of antecedent basis in a claim renders the claim indefinite.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 – 6 and 9 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, US 6,924,864 in view of Arao, US 6,639,265.

Regarding claims 1 and 12, Kim teaches a method of manufacturing a contact portion, the method comprising:

- forming a first signal line 216 on a substrate 200;
- forming an insulating layer 218 covering the first signal line and having a contact hole 236 exposing the first signal line 216;
- and forming a second signal line 238 connected to the first signal line, wherein the first signal line is made of Al or Al alloy, and the second signal line is made of ITO or IZO with reference to Figs. 3 and 4A – 4D in between column 5, line 39 and column 8, line 20.

Kim fails to teach form a contact layer on the exposed surface of the first signal through the contact hole and connect the two signal lines via the contact layer.

Arao teaches a method of making an LCD device having contact portion wherein a contact layer 1256 is formed on the exposed surface of the signal lines with reference to Figs. 22A and 22B in between column 27, line 29 and column 28, line 16 for the

benefit of operating the TFTs under different operating conditions and to avoid hot carrier effect in column 2, lines 63 – 67.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kim and form a contact layer on the exposed surface of the first signal through the contact hole and connect the two signal lines via the contact layer for the benefit of operating the TFTs under different operating conditions and to avoid hot carrier effect as taught by Arao in column 2, lines 63 – 67.

Regarding claims 2, 3 and 13, Kim in view of Arao teaches forming a Ti and Al film, but fails to teach wherein the substrate is soaked in chemical conversion solution including a conductive material to form the contact layer, wherein chemical conversion solution include at least one of W, Zr, Mo, and Cr.

However, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kim in view of Arao to replace the Ti or Al contact layer with other metals such as W, Zr, Mo, and Cr since these metal conductive layers will be functionally equivalent. Additionally, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kim in view of Arao to form the contact layer by soaking the substrate in chemical conversion solution including a conductive material to form the contact layer for the benefit of using a simple electroplating or electroless plating method instead of cumbersome vacuum deposition method.

Regarding claims 14 and 15, Kim in view of Arao teaches the contact portion further comprising a lower layer formed under the first signal line, wherein the lower

layer is a conductive layer including at least one of Cr, Ti, Mo, and MoW alloy as were described earlier in rejecting claims 1 – 3 and 12 – 14.

Regarding claim 4, Kim teaches a method of manufacturing a thin film transistor array panel, the method comprising:

- forming a gate line 214 on a substrate 200;
- forming a gate insulating layer 218;
- forming a semiconductor layer 220;
- forming an ohmic contact layer 222; forming a data line 224 and a drain electrode 228;
- forming a passivation layer 232 having a first contact hole 234 exposing the portion of the drain electrode 228 with references to Figs. 3 and 4A – 4D in between column 5, line 39 and column 8, line 20..

Kim fails to teach forming a first contact layer on the exposed surface of the drain electrode through the first contact hole.

Arao teaches this deficiency of Kim as was described earlier in rejecting claims 1 and 12.

Regarding claims 5 and 6, Kim in view of Arao teaches the limitations as were described earlier in rejecting claims 2 and 3.

Regarding claim 9, Kim teaches the step of forming a storage electrode line with the same layer as the gate line with reference to Fig. 4A.

Regarding claim 10, Kim teaches a second contact hole 236 exposing the end portion of the storage electrode line 216 is formed in the step of forming the passivation layer 232 with reference to Fig. 4C.

Regarding claim 11, Kim in view of Arao teaches a second contact layer is formed on the exposed surface of the storage electrode line through the second contact hole in the step of forming the first contact layer as was described earlier in rejecting claims 2, 3 and 13 – 15.

***Allowable Subject Matter***

6. Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 16 – 30 are allowed.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2891

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Asok K. Sarkar/  
Primary Examiner, Art Unit 2891

March 7, 2008